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WEATHER IN THE LAST CENTURY. 1713—1745.

EARLY records of the weather being somewhat rare, the following notes are, we think, worthy not merely of preservation, but of publication. They were kindly furnished to us by Mr. Basil Woodd Smith, of Hampstead, and are derived from a register kept at Richmond, Surrey, by Mr. George Smith, a Proctor to Queen Anne. The register contains a record of daily observations (made without instruments) from April, 1713, to June, 1745. Mr. Smith died, aged 70, in July of that year, and was buried in Richmond Churchyard, where his tombstone is to be found. A transcript of the register was given some time ago to the Royal Meteorological Society and placed in its library.

We give chiefly the summaries made by the observer, and a few of his occasional notes.

It is to be observed that—

1. The recorder is a good deal given to the use of superlatives.
2. He uses the word "season" sometimes to express a very limited space of time, and at others in its usual more extended sense.
3. In his summaries at the end of December it is not always clear whether "winter" refers to the previous winter or to the actual one. In some cases the note seems to have been filled in later.
4. The dates are those of the Old Style, requiring the addition of eleven days to bring them into correspondence with dates since September 2nd, 1752, when the New Style came into use.

A propos of the frequent reference to figs, a family tradition relates that Mr. Smith was in the habit of sending a basket of figs to Queen Anne every year. On one occasion he omitted his customary present, and on the Queen saying, "Proctor, how is it you have sent me no figs this year?" he replied: "Please your Majesty, the basket was not returned."

1712—13. Unsettled year. Jany. to May chiefly cold. "Dull, wet summer." June 23, 24 "very hott"; 25, 26 "cold as Xmas." July warmer, but (30) "generally a very wet season since S. Swithin, no fruit"; Aug. 31. "Good harvest weather all this moon, but the first fortnight extream fine." Nov. 8. "Small rain froze or it fell, extream slippery." December warmer. (18) "A great storm, thunder, lightning, hail and rain from N.W."

1713—14. Jan. 25. "The dryest time that ever I knew, and the finest weather; like Aprill." 31. "Mighty fine." Feb. 11–14. "Dusty as May. Warm enough." 16. "The largest snow I ever saw." 19. "The Highest Tyde ever known." April 5. Very hard frost killed fruit." May 6. "Very hard frost, rain all day from N.E." June 21–27. "Extream hott and clear and dry. Wind E most part." July 25–31. "Extream good harvest weather; corn all in by end of month." Aug. 1. "Qu: Anne dyed at ½ after 7 morn." Sep. 18. "King George landed at Greenwich at 6 even." 20. "K George entred thro London." Summer generally fine. Dec. 13. "Hard frost as ever known; in one night much ice in Thames."

1714—15. April 22. "Totall Eclipse of the Sun, very dark; Starrs to be seen." June 30. "Extr: wet season, damaged hay and corn." Year appears to have been generally warm, but no further special remark called for by weather till Nov. 11, "hard frost." 20. "Very thick stincking fog all day." Frost lasted off and on till Dec. 27, "Ice fixed" in river. 29. "Thames passed; people went over."

1715—16. Jan. 7. "Ground like glass." 9. "hardest frost of all." 19. "Great snow in night." 26. "Ice broke at 3 morn." March 5. "Extraordinary appearance in the air, light and fire and dark clouds." (Dr. Halley did not see this, but describes the aurora of Nov. 6, 1719, which is not noticed by our observer, as the first he had seen.) Summer mostly dull. Sept., frequent high winds. 13. "Great storm all night; great harm."

1716-17. March 30. "Streaks of light in the sky from N." Weather mostly warm and cloudy in first months of year. Some hot days in June. 16. "Thunder and very great lightning." Summer mostly hot. Nov. 23. "Very terrible night for wind and rain, thunder and lightning." Dec. 14. "Morn. highest Tyde ever known, tho the moon in the last quarter; occasioned probably by a great Storm all night at N.W. Overflowed Westminster and keys at Custome house. Extr. great Damage in Holland."

1717—18. Observer's summary. Dec. 31. "The Sumer was very hott and dry; extr. good grapes; very little other good fruit; 2nd crops white figs ripe; harvest very forward, all got in begin. Sept. Extr. mild winter."

1718—19. March 19. "About 8 ev. extr. ball of fire in the sky, light as sun." Aprill "Extr. dry season." Dec. 31. "This Summer was very hott and dry; good grapes, no other fruit. The

second crop of figs ripe at Michaelmas; very mild dry winter, water very low."

1719—20. Dec. 31. "All Xmas warm as April, trees ready to blossom. The Summer wet and green; with little good fruit. Grapes late ripe, but some good. Winter warm and wet, no frost, mildest season ever known."

1720—21. No summary. Jan. and Feb. cold. Summer apparently cloudy and dull. Autumn variable.

1721—22. "Wet Sumer; fair fine Autumn; very good grapes; fine fair mild dry winter."

1722—23. May 31. "Extror. dry Season as ever known." June 28 and Sep. 30 similar entries. Dec. 31. "Longest Sumer ever known, very dry; good grapes; 2 crop of figs, some blew (? purple) ripe. Dry warm winter. 3 weeks at Xmas fine weather as April."

1723—24. April 30. "A very kindly fine April." May 11. "Sun eclipsed almost total dark, but not plain to be seen by reason of dark clouds." June 9. "Extream hot. Aftn. great storm, rain, great hail thunder and very high wind N., perfect hurricane and Spout, Even very hot." Dec. 31. "Very long Sumer, good grapes. 2nd crop figs ripe in Sep., great plenty all sorts of fruits, especially apples and pears, tho' no good pears. Fine winter, dry till lately."

1724—25. Feb. 28. "Extr. dry time. Fine weather." June 30. "The wettest and coldest season ever known in Sumer; fires kept every night till 28 June." July 31. "This whole month more like Winter than Sumer." Dec. 31. "Extraordinary unkindly Sumer. Constant Rains and Cold; no good fruit, rotten before ripe; no grapes at all; figs rotted on the trees. Winter warm and wet; very little frost, no snow."

1725—26. Sept. 30. "A great Landwater for 10 daies." Nov. 30. "Finest November ever known." Dec. 31. "Very kindly year; long Sumer; few grapes on vines, those extraordinary good; good fruit all sorts. 2nd crop figs ripe, wet winter, great land waters, and very hard frost, and great snows before Xmas."

1726—27. Feb. 28. "A very great landwater as known these many years. Springs extr. high, wet season." Nov. 30. "Waters very low." Dec. 31. "Kindly year; vast quantity of grapes and very good. 2nd figs ripe in Sept., no apples or pears. Dry winter, waters very low, a deal of foggy weather and some very hard frost and great snow before Xmas."

1727—28. No summary. Weather not very marked.

1728—29. Feb. 28. "This has been the longest coldest season ever known, the spring is now as backward as in December. Dec. 31. "Very wet and warm winter, no frost or snow."

1729—30. April 30. "Very dry burning weather." July 3. "Spout of rain and wind; extr. great shower." Oct. 31. "Very dirty season as ever known; warm." No general summary of year.

1730—31. May 31. "Exceeding dry Season, no grass." Dec. 18.

"Fair and fine, cold." 27. "Extream cold, hardest frost ever known in one night with snow." 29. "Snow all gone, warm, fine." 31. "Mild. Short winter, very dry time. Thames as low and dry as in Sumer."

1731—32. July 31. "Very dry, good harvest." Aug. 31. "Very dry season." Sep. 30. "Very dry season." Dec. 31. "The year ends with warm moist dirty weather."

1732—33. No summary. Apparently cool summer. Dec. 31. "Cloudy warm dirty weather, S. and S.W. with some storms ends the year."

1733—34. Dec. 31. "An extra. wet season, land floods very high, and lasted till the middle of January." No general summary.

1734—35. Feb. 28. "A very wet dirty time; land floods." Dec. 31. "Wet warm dirty season. Very wet unkind year. No grapes. Good plumbs and apples."

1735—36. Feb. 16 "Greatest tyde ever known; much damage in cellars and warehouses. Marshes overflowed, cattle drowned." 29. "Extream cold all the month." July 31. "An extream hot time." Aug. 31. "Extr. fine weather." Oct. 31. "A very warm, dirty, hazey month." Dec. 31. "A very mild winter, wet summer, little good fruit.

1736—37. April 30. "Dry and dusty." May 31. "Very hot dry time." June 30. "Very dry season." July 31. "Cool season." Aug. 31. "Cold wet season." Sep. 30. "Warm and wet season." Dec. 31. "Mild winter, unkindly wet summer, no good fruit."

1737—38. Jan. 31. "The finest season for the time ever known." April 30. "Very cold unkindly season; nothing grows." Aug. 31. "A very wet unkindly cold season, no good fruit." Sep. 30. "A very wet time as ever known. Extr. heavy showers, little thunder." Nov. 30. "The most kindly month in the whole year."

1738—39. April 30. "A very unkind season till the 25. Since, fine growing weather. All fruit killed." June 30. "Very fine hay harvest." Sep. 30. "All the month wet, dark, warm, too close; a very bad season for fruit and corn." Oct. 30. "This month pretty good weather, but cold." Dec. 30. "Thames froze over in 4 daies. Storm of wind 48 hours."

1739—40. Jan. 1. "Some people walked over the Thames." (Frost continued till Feb. 1, when thaw began in day, frost returning each night.) Feb. 11. "Ice all gone in Thames upward but not broke abt. London." 13. "Ice begins to run in Thames." 17. "Ice broke in Thames." 23. "Ice gone at London." 29. "This was the severest frost I ever knew, and the most kindly thaw. No rain, roads good, all garden stuff destroyed." Hard frost again in March. 31. "A very backward spring, dry and dusty as summer; no considerable rain 3 months past; the river as low as ever known." April 21. "Very great storm snow and wind from 10 to 2." 30. "A very cold unkind season." May 31. "Extr. dry dusty and cold, very unpleasant season." July 31. "A very dry time, pleasant

weather." Aug. 31. "Fine harvest weather, great dews." Sep. 30. "The coldest weather ever known at Michs. Piercing cold." Dec. 31. "A very unkind year; no good fruit, nor warm weather; winter severe; storms and frost with great snow."

1740—41. March 30. "A very terrible unkind season." Apl. 30. "A very dry cold season." June 30. "Glorious hay harvest." July 31. "Fine harvest as ever known; dry, dusty, no grass." Aug. 31. The finest harvest weather ever known; hot and dry; no grass, good fruit, harvest in by 20 August." Sep. 30. "The finest season ever known; warm and kindly." Oct. 31. "Fine season as ever known." Nov. 30. "Very mild kindly season, warm and fine." Dec. 13. "Clear very hard frost, great rime not melted by the sun tho' shone all day; trees white as snow." Dec. 31. "A very kindly year; sumer very hot and dusty; very good fruit, plumbs and grapes: Winter mild and fine till Xtmas, and then hard frost; ice in Thames."

1741—42. March 31. "An extr. cold dry time as ever known; no rain all this month; dusty as Midsummer." April 30. "Extr. dry and dusty time." June 30. "Seasonable showers after a very dry long season." Aug. 31. "An extraordinary dry season, fine harvest but no grass, nor good fruit; great plenty of corn. No rain for five weeks, hot burning sun." Sep. 30. "Very cold dry unkindly season, no grass; grapes not ripen." Oct. 31. "Very kindly seasonable weather all this month with high winds." Dec. 13. "Hardest frost, much ice in Thames, boates not able to go."

1742—43. Jan. 27. "In night great tyde." Feb. 20. "Very fine season." 28. "An extraordinary pleasant month." March 31. "A cold unkindly season, tho' some fine raines." Frost and snow first few days of April. April 30. "The beginning of this month cold and dry and dusty; the end extr. seasonable, fine raines." July 31. "Very fine kindly harvest and great plenty." Aug. 31. "Dry dusty time." Nov. 30. "Very fine weather latter end of the month." Dec. 31. "Hardest frost, clear, ice runs in river."

1743—44. Jan. 6. "Thames clear of ice." Feb. 1. "Comet appears plain and bright all evening till past eight." 18, 19, 24, 25, 28. Storms of wind. 29. "A very stormy season." May 31. "Very hot dry and dusty time." June 20. Similar entry. July 31. "Good harvest weather." Aug. 31. "A very stormy season." Sep. 10. "Great storm of wind, lasted 24 hours; all fruit blown down." Sep. 30. "A warm wet season. No grapes. Plumbs and pears extra good." Oct. 29. "Great landwater." Dec. 31. "Extr. fine weather ends the year."

1744—45 No special character. Diary ends June 3, 1745. Mr. Smith died July 26.

THE SCIENTIFIC USE OF KITES.

To the Editor of the Meteorological Magazine.

SIR,—I appreciate very highly your kindly words relative to the use of the kite for scientific purposes, and, therefore, hasten to reply to the query on page 148 of your magazine for November, where you say "a kite can go up only when there is wind, a balloon can go up in a calm; a kite cannot carry as much weight as a balloon. Why are kites better than captive balloons?" I reply, because the captive balloon has a narrow field of usefulness, whereas the kite has a wider field and is more efficient therein when the wind is blowing. May I call your attention to the fact that, in the greater portion of the United States, there are many days when it is too cold to manage a balloon on account of the stiffness of the cordage, and the material of which the bag is made. There are also many other days on which the wind and upper currents are entirely too strong to allow of operating a captive balloon at all. There are many days of rain or snow when the balloon is laden by these so heavily that it will not rise to advantage. In general, the captive balloon rises but a 1,000 ft., whereas a kite may go up to 10,000. Probably, you have the same difficulties occasionally in Europe. At many of our stations the captive balloon would be useless half the time, and, except in perfect calms, far less efficient than a kite. Hitherto we have not found the rain, the wind, or the cold to interfere seriously with kites. There are, of course, many hours when the wind is too light for a heavily laden kite to start, but in such cases a lighter kite or balloon may be used to assist. The advantages of the kite over the free balloon are manifold, the most important items are: (1) You are sure of having the thermometers well ventilated; (2) You have no need of travelling 500 miles to get your records back again; (3) Relatively slight expense of money and time. The advantages over captive balloons are especially manifest in windy weather, when the wind causes the balloon to oscillate violently within a few hundred feet of the ground, while the cord that holds it captive is inclined at an angle of ten degrees, whereas the same wind elevates the kite to an angle of fifty or sixty degrees, and to a height of five or ten thousand feet, where it floats with a steadiness that is beautiful to behold. The self-registering apparatus may be made of various weights, from one pound up to fifty, and our kites will carry these up as easily as will a balloon. If either kite or balloon breaks loose, the balloon is liable to be carried away much farther than a kite, therefore, more liable to be lost entirely. Our biggest kites that broke away at a height of 7000 ft. during a violent local storm, were recovered unharmed after they had descended to the ground fifteen miles away.

We are confident that there is an important field of usefulness for the kite, and we hope to develop this without neglecting the balloon.

Will not our European Colleagues join in the work?

With highest regard, I remain,

Yours truly,

WILLIS L. MOORE,

Chief of Bureau.

U.S. Department of Agriculture, Weather Bureau,
Washington, D.C., November 30th, 1896.

[Prof. Moore has made out a very strong case for kites, and as he says that the balloon shall not be neglected, we think that the matter may be left where it is.

As regards European co-operation, although we have not heard of anything being done in England, we believe that much is being attempted on the Continent.—ED.]

REVIEWS.

Elementary Meteorology for High Schools and Colleges, by FRANK WALDO, Ph.D., late Junior Professor, U.S. Signal Service, Member of the Austrian and German Meteorological Societies, &c. American Book Company, New York, Cincinnati and Chicago [1896]. Sm. 8vo, 373 pages, 121 maps and engravings.

YET another American work on Meteorology, and one for schools! Surely with all this teaching there ought to be amply sufficient readers to support an American Meteorological Magazine.

We do not know how to reconcile the rapid succession of works by Waldo (1893), Davis (1894), Russell (1895), and now a fresh one by Waldo (1896), with the death from inanition of our excellent friend the *American Meteorological Journal.*

However we are not called upon to solve that problem, but to express our opinion of the new arrival. We like it very much, and think that many whose school and college days are only memories in the far past, would enjoy this book—the like of which assuredly they never had either at school or at college.

It seems to us that Dr. Waldo has rarely forgotten for whom he was writing, and while not allowing any wrong statement to appear, has checked himself when tempted to run off into elaborate formulæ or detail—thus producing a well balanced work which, as far as we have noted, few could read without pleasure and profit.

On page 104 Dr. Waldo has made a slight slip—purely accidental. The words used might lead a youth to suppose that Robinson's cups are the only pattern of anemometer!

On page 172 there is a useful block representing Solar Halos and Parhelia, but good as it is, we think that the insertion of a Z or the word Zenith would improve it, and we should have added the vertical circle, through the sun, which produces the phenomenon known as a "Sun pillar." We also notice that the parhelia are represented as absolutely at the intersections of the various halos, which is rarely the case.

There is one expression (perfectly obvious to those familiar with the subject) on p. 176 which we should alter. Speaking of the aurora borealis Dr. Waldo says :

"The auroral arch usually spans the sky in an east-westerly direction. In the middle latitudes it is seen to the north, and in extreme northern latitudes to the south."

We think that for the moment the author had forgotten the southern hemisphere, and the aurora australis, and did not realize that his expression "to the south" might be imagined to mean on the southern horizon. He doubtless meant to state that arctic travellers have reached latitudes north of the auroral belt, and therefore seen it south of the zenith, but we think that it might be expressed more clearly.

The half chapter devoted to Tornadoes is excellent, but we should have given the pressures in inches of mercury, as well as in pounds. Though a barometric depression in their centre of 7½ *inches* seems to us excessive, Dr. Waldo doubtless has Prof. Ferrel at his back, and therefore it is somewhat rash to criticize this value, but a third of it would give an expansive force of more than half a ton on each square yard of surface, and a thirtieth of it or 0·25 inch would give a lifting force of about a ton for each 13 square yards—or two tons to the ceiling of a small room 15 ft. square. Therefore, terrible as is the wreckage along the path of a tornado, we do not see the need for imagining a depression so far beyond anything ever observed. We shall probably not often have a better chance of a record of the actual depression than that of the barograph in the *Tour St. Jacques* during the small whirlwind which stripped roofs and overturned so heavy a vehicle as a Paris omnibus—its centre went within a few yards of the *Tour St. Jacques* and the barometer fell suddenly and momentarily—not 7½ inches but 0·24 inch, almost precisely what we suggested.

The whole tone of the book is good, for while the author brings in the latest discoveries (*e.g.*, Argon) we come on sentences like the following :

"The science is as yet but partially developed, and much that is at present accepted as fact will be modified by future investigations," and again, after showing that theoretically carbon dioxide ceases at about 10 miles above the earth's surface, water vapour at 12, oxygen at 30 and nitrogen at 35 miles, he states :

"Observations indicate, however, that the atmosphere extends much higher than this, which shows that our knowledge of the laws of atmospheric gases is still incomplete."

As a rule the illustrations are good, but those on pages 31, 218 and 244 are feeble, and why should metric values be used on them whereas in all the rest of the work English scales are employed? On the other hand we think that this is the first text book illustrated with engravings of snow crystals made from photographs of the crystals themselves. The book is handy, well printed and on good paper.

The Psychrometer. 8vo, 4 pp.

This is a remarkable paper, only four pages, with no indication of author, printer, or place—but it reached us in an envelope dated at Washington, U.S.A., Oct. 22nd, 1896.

The writer is perhaps prudent in preserving his anonymity, considering how severely he criticizes not merely the Assmann Aspirator, but the Editors of the *Zeitschrift* for admitting two recent articles. The anonymous writer is evidently one of vigour and ability, though we have an impression that even he does not know quite all that has been recently done respecting the theory of the wet bulb thermometer, but we do not at present intend to take any part in the controversy. A copy has doubtless been sent to the Editors of the *Zeitschrift*, and they will deal with it as they think best.

It is however rather amusing that at the end of September the International Congress of Meteorologists at Paris recommended the use of the Assmann Aspirator as if it were perfection, and in the early days of October this paper attacking it was being sent to the printer.

ROYAL METEOROLOGICAL SOCIETY.

THE first monthly Meeting of this Society for the present session was held on Wednesday, November the 18th, at the Institution of Civil Engineers, Great George Street, Westminster; Mr. E. Mawley, F.R.H.S., President, in the chair.

Mr. W. Ellis, F.R.S., presented his Report on the Proceedings of the International Meteorological Conference, held at Paris, from September 17th to 23rd, which he attended as the delegate from the Royal Meteorological Society.

The subjects suggested by the Society for discussion were:—

Question 6.—"The registration of bright sunshine." It was resolved that for the purposes of general climatology it is necessary that the instrument shall be so placed as to have an uninterrupted horizon. The number of hours of sunshine should be referred to the total apparent duration of the day, but with the application for each instrument of a correction relative to observations when the sun is close to the horizon.

Question 7.—"The desirability of more extended observations on infiltration into the soil, and uniformity in the same." The Committee recorded that they had listened with much pleasure to the discussion to which the question had given rise, but that it appeared to be impossible, in the actual state of the question, to frame any resolution thereon.

Question 8.—"The general adoption of a standard anemometer for the determination of the velocity of the wind."

Question 9.—"The general adoption of a uniform system of exposure for anemometers." Resolved that the Sub-Committee is of opinion that it is not possible in the present state of the question, to

recommend the use of any existing instrument as a standard, or of any mode of erection identical at all stations.

Question 12.—"Uniformity of conditions under which earth temperatures should be taken." It was recommended to continue investigations into the subject, and to prepare a report for the next Conference.

The Hon. F. A. Rollo Russell read a paper on "Haze, Fog and Visibility." From his own observations in Surrey he considers that haze is most prevalent when the wind is from the north-east, and is due probably to slight condensation of moisture by partial mixture of conflicting currents of air. The causes of fog are to a great extent the same as the causes of haze, although radiation in certain states of the air and ground plays a more conspicuous part. The main cause of fog is mixture of airs of different temperatures; and the attainment of a size of water particle so much larger than in the case of haze is due to suddenness of mixture, greater humidity, or greater differences of temperature.

The President, Admiral Maclear, and Messrs. Gaster, Marriott and Ellis took part in the discussion.

BAROMETRI DESCRIPTIO.

By Joseph Addison, 1672–1719.

We never associated "The Spectator" with meteorology, but Mr. Inwards recently called our attention to the following poem by Addison, and on the assumption that it is as novel to most of our readers as it was to us, we reprint it. Can any of our readers refer us to a good translation? If so, it might be worth while to print it.

Qua penetrat fossor terræ cæca antra, metallo
Fœcunda informi rudibusque nitentia venis;
Dum stupet occultas gazas, nummosque futuros,
Eruit argenti latices, nitidumque liquorem,
Qui nullo effusus prodit vestigia tractu,
Nec terram signo revolubilis imprimit udo,
Sed fractus sparsim in globulos formam usque rotundam
Servat, et in terretes lapsans se collegit orbes.
Incertum qua sit natura, an negligat ultra
Perficier, jubar et maturas inutile temnat;
An potius solis vis imperfecta relinquat
Argentum male coctum, divitiasque fluentes;
Quicquid erit, magno se jactat nobilis usu;
Nec Deus effulsit magis aspectabilis olim,
Cum Danaen flavo circum pretiosus amictu
Ambiit, et gratam suadente libidine formam,
Depluit irriguo liquefactum Numen in Auro.
Quin age, sume tubum fragilem, cui densior aer
Exclusus; fundo vitri subsidat in imo

Argenti stragnun; ut pluvia impendente metallum
Mobile descendat, vel contra, ubi postulat æstas,
Prodeat hinc liquor emergens, et rursus inane
Occupet ascensu, tubulumque excurrat in omnem.
  Jam cœli faciem tempestatesque futuras
Conscia lympha monet, brumamque et frigora narrat.
Nam quoties liquor insurgit, vitreoque canali
Sublatum nequeunt ripæ cohibere priores
Tum lætos sperare dies licet, arva fatentur
Æstatem, et large diffuso lumine rident.
Sine sese immodicum attolens Argenteus humor,
Et nimium oppressus, contendat ad ardua vitri,
Jam sitiunt herbæ, jam succos flamma feraces
Excoquit, et languent consumto prata vivore.
  Cum vero tenues nebulas spiracula terræ
Fundunt, et madidi fluitant super æquora fumi
Pabula venturæ pluviæ; tum fusile pondus
Inferiora petit; nec certior Ardea cœlos
Indicat humentes, medias quando ætheris oras
Tranando, crassa fruitur sublimius aura.
Discutit et madidis rorantia nubila pennis,
Nunc guttæ agglomerant, dispersas frigora stipant
Particulas, rarusque in nimbum cogitur humor:
Prata virent, segetem fœcundis imbribus æther
Irrigat, et bibulæ radici alimenta ministrat.
Quin ubi plus æquo descendens uda metalli
Fundumămat, impatiens pluviæ, metuensque procellam,
Agricolæ caveant; non hoc impune colonus
Aspicit; ostendet mox fœta vaporibus aura
Collectas hyemes, tempestatemque sonoram.
At licet Argentum mole incumbente levatum
Subsidat, penitusque imo se condat in alveo,
Cætera quæque tument; eversis flumina risis
Expatiata ruunt, spumantibus æstuat undis
Diluvium, rapidique effusa licentia ponti.
  Nulla tacet secreta poli mirabile vitrum,
Quin varios cœli vultus et tempora prodit.
Ante refert, quando tenui velamine tutus
Incedes, quando sperabis frigidus ignem.
  Augurio hoc fretus, quanquam atri nubila cœli
Disrumpunt obscura diem, pluviasque minantur,
Machina si neget, et sudum promittat apertum,
Audax carpat iter nimbo pendente viator;
Nec metuens imbrem, poscentes Messor aristas
Prosternat; terræ jam bruma incumbit inermis,
Frigoraque haud nocitura cadunt, feriuntque paratos.

JOSEPH ADDISON.

Vol. VI., p. 427. Tickell's Addison.

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, JUNE, 1896.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Absolute. Maximum. Date.	Absolute. Minimum. Temp.	Absolute. Minimum. Date.	Average. Max.	Average. Min.	Average. Dew Point.	Average. Humidity.	Absolute. Max. in Sun.	Absolute. Min. on Grass.	Total Rain. Depth.	Total Rain. Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
England, London	85·1	15	41·1	1	75·2	54·0	53·2	71	135·9	32·3	2·27	11	5·7
Malta	89·5	25	56·0	3	82·8	66·1	64·2	78	146·6	50·0	·00	0	3·7
Mauritius	76·6	9	58·0	26	74·6	65·0	61·2	77	124·1	49·1	1·12	13	4·9
Calcutta	93·9	9	72·7	1	89·7	77·1	76·7	83	158·7	69·4	16·42	15	7·8
Bombay	92·9	1	75·0	21	87·6	79·6	78·0	83	143·7	72·3	28·02	27	...
Ceylon, Colombo	88·2	...	73·2	5	85·8	77·3	75·3	86	151·0	70·0	8·37	18	7·5
Melbourne	62·5	10	33·2	2	56·1	42·7	43·9	80	109·0	24·2	2·58	13	6·4
Adelaide	65·3	12	37·3	20	59·2	45·4	44·2	77	125·8	28·5	3·15	19	4·9
Sydney	67·2	28	42·5	22	59·0	48·4	50·0	87	106·3	30·3	14·71	16	5·2
Wellington	66·0	17	38·5	4	55·9	45·4	44·2	80	108·0	23·0	6·00	16	5·3
Auckland	64·5	3	43·0	12	60·9	48·9	45·3	71	115·0	36·0	3·27	21	5·5
Jamaica, Kingston	91·6	16	71·8	17	89·0	75·3	69·9	70	...	...	·90	5	3·3
Trinidad	94·0	6	68·0	22	88·9	71·7	72·6	80	175·0	67·0	10·29	21	...
Grenada	84·2	7	71·0	29	82·9	74·2	72·0	82	146·2	...	8·16	21	4·0
Toronto	86·3	7	41·9	3	75·9	53·9	52·6	66	101·5	36·0	1·11	6	4·0
New Brunswick, Fredericton	84·8	20	35·0	14	72·2	46·2	48·0	62	...	...	1·92	8	4·0
Manitoba, Winnipeg	84·5	15	42·7	6	74·6	53·4	...	...	...	...	3·96	16	5·0
British Columbia, Esquimalt	86·4	26	39·3	13	65·6	48·1	48·1	81	...	...	·69	6	6·0

REMARKS.

MALTA.—Adopted mean temp. 73°·3, or 1°·8 above the average. Mean hourly velocity of wind 8·5 miles. Average temp of sea 68°·3. L on 1st and 16th. Temp. of dew point and humidity the highest yet recorded for June. J. F. DOBSON.

Mauritius.—Mean temp. of air 0°·7 below, of dew point 0°·6 above, and rainfall ·88 in. below, their respective averages. Mean hourly velocity of wind 10·9 miles or 0·5 mile below average; extremes, 26·4 on 20th, and 2·7 on 22nd; prevailing direction, E.S.E. T. F. CLAXTON.

CEYLON, COLOMBO.—Thunderstorms occurred on the 16th; distant thunder on the 12th, 13th, and 14th. D. G. MANTELL.

Adelaide.—Mean temp. 2°·2 below the average of 39 years. Rainfall ·36 in. above the average. C. TODD, F.R.S.

Sydney.—Rainfall 7·35 in. above, temperature 0°·7 below, and humidity 8·6 above, their respective averages. H. C. RUSSELL, F.R.S.

Wellington.—Fine in the early part of the month. Maximum rain on 8th, 2·25 in., then fine again until the 15th, from which date until the end it was generally showery. Winds throughout moderate and variable, and frequent calms. Fogs on five days. Mean temp. 1°·6 above, and rainfall ·79 in. above, their respective averages. R. B. GORE.

Auckland.—An unusually dry and warm June, the rainfall being quite 1·50 in. below, and the mean temp. 1° above, the average. T. F. CHEESEMAN.

JAMAICA, KINGSTON.—Mean hourly velocity of wind 5·2 miles. Kingston rainfall one-fifth of the average, Island rainfall half the average. R. JOHNSTONE.

TRINIDAD.—Rainfall 2·25 in. above the 30 years average. J. H. HART.

SUPPLEMENTARY TABLE OF RAINFALL, NOVEMBER, 1896.

[For the Counties, Latitudes, and Longitudes of most of these Stations, see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
II.	Dorking, Abinger Hall .	1·94	XI.	Lake Vyrnwy	1·40
,,	Birchington, Thor	2·01	,,	Corwen, Rhug	1·18
,,	Hailsham	1·62	,,	Criccith, Talarvor.....	1·19
,,	Ryde, Thornbrough	·87	,,	I. of Man, Douglas	2·24
,,	Emsworth, Redlands ...	·91	XII.	Stoneykirk, Ardwell Ho.	1·14
,,	Alton, Ashdell	1·31	,,	New Galloway, Glenlee	2·03
III.	Oxford, Magdalen Col..	·73	,,	Lilliesleaf, Riddell	1·14
,,	Banbury, Bloxham	1·20	XIII.	N. Esk Res. [Penicuick]	1·60
,,	Northampton, Sedgebrook	1·04	,,	Edinburgh, Blacket Pl..	·65
,,	Alconbury	·84	XIV.	Glasgow, Queen's Park..	1·07
,,	Wisbech, Bank House...	1·05	XV.	Inverary, Newtown	5·16
IV.	Southend	1·03	,,	Oban, The Corran	4·07
,,	Harlow, Sheering..... ...	...	,,	Islay, Gruinart Schools..	1·25
,,	Colchester, Lexden	·81	XVI.	Dollar.....	1·12
,,	Rendlesham Hall	1·32	,,	Balquhidder, Stronvar...	3·12
,,	Rushall Vicarage	1·49	,,	Ballinluig	·94
,,	Swaffham	1·08	,,	Dalnaspidal H.R.S.....	2·15
V.	Salisbury, Alderbury ...	·65	XVII.	Keith H.R.S.....	1·53
,,	Bishop's Cannings	·73	,,	Forres H.R.S.	1·22
,,	Blandford, Whatcombe .	1·00	XVIII.	Fearn, Lower Pitkerrie..	·41
,,	Ashburton, Holne Vic...	1·57	,,	N. Uist, Loch Maddy ...	3·52
,,	Okehampton, Oaklands.	1·55	,,	Invergarry.....	3·52
,,	Hartland Abbey	1·47	,,	Aviemore H.R.S.	1·02
,,	Lynmouth, Glenthorne.	1·50	,,	Loch Ness, Drumnadrochit	1·15
,,	Probus, Lamellyn	1·14	XIX.	Invershin	·73
,,	Wellington, The Avenue	·87	,,	Scourie	3·92
,,	Wincanton, Stowell Rec.	1·10	,,	Watten H.R.S.....	1·63
VI.	Clifton, Pembroke Road	·75	XX.	Dunmanway, Coolkelure	3·10
,,	Ross, The Graig	·70	,,	Cork, Wellesley Terrace	1·52
,,	Wem, Clive Vicarage ...	1·18	,,	Killarney, Woodlawn ...	1·55
,,	Cheadle, The Heath Ho.	1·36	,,	Caher, Duneske	1·11
,,	Worcester, Diglis Lock	·73	,,	Ballingarry, Hazelfort...	1·02
,,	Coventry, Coundon	1·67	,,	Limerick, Kilcornan ...	·69
VII.	Ketton Hall [Stamford]	...	,,	Broadford, Hurdlestown	1·19
,,	Grantham, Stainby	·95	,,	Miltown Malbay	1·49
,,	Horncastle, Bucknall ...	1·04	XXI.	Gorey, Courtown House	·86
,,	Worksop, Hodsck Priory	1·18	,,	Athlone, Twyford	1·10
VIII.	Neston, Hinderton	·85	,,	Mullingar, Belvedere ...	1·31
,,	Southport, Hesketh Park	1·59	,,	Longford, Currygrane...	1·20
,,	Broughton-in-Furness ...	1·75	XXII.	Woodlawn	1·20
IX.	Ripon, Mickley.....	1·40	,,	Crossmolina, Enniscoe ..	2·39
,,	Melmerby, Baldersby ...	1·36	,,	Collooney, Markree Obs.	1·55
,,	Scarborough, Obs.	1·11	,,	Ballinamore, Lawderdale	1·82
,,	Middleton, Mickleton ...	·85	XXIII.	Lough Sheelin, Arley...	1·24
X.	Haltwhistle, Unthank...	1·08	,,	Warrenpoint.....	1·63
,,	Bamburgh	1·50	,,	Seaforde.....	1·35
,,	Keswick, The Bank.....	1·84	,,	Belfast, Springfield	2·04
XI.	Llanfrechfa Grange	1·03	,,	Bushmills, Dundarave..	1·30
,,	Llandovery	1·42	,,	Stewartstown	1·05
,,	Castle Malgwyn	1·85	,,	Killybegs	2·48
,,	Builth, Abergwesyn Vic.	2·31	,,	Lough Swilly, Carrablagh	...
,,	Rhayader, Nantgwillt ...	2·08			

NOVEMBER, 1896.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1880-9.	Greatest Fall in 24 hours. Dpth	Greatest Fall in 24 hours. Date	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Max. Date	Min. Deg.	Min. Date.	No. of Nights below 32°. In shade.	No. of Nights below 32°. On grass
			inches.	inches.	in.								
I.	ENGLAND.	London (Camden Square) ...	1·17	— 1·49	·43	7	10	50·3	12	25·4	30	7	20
II.		Maidstone (Hunton Court)...	·90	— 2·03	·43	7	6	...	...	...	...	...	...
,,		Strathfieldsaye	1·39	...	·43	9	9	...	...	...	...	...	...
III.		Hitchin	1·10	— 1·58	·48	7	11	50·0	12	20·0	29	15	...
,,		Winslow (Addington)	1·28	— 1·65	·53	7	9	53·0	21	21·0	7	13	20
IV.		Bury St. Edmunds (Westley)	1·15	— 1·40	·41	1	7	49·0	1, 22	26·0	30	..	...
,,		Norwich (Brundall)	1·48	...	·51	14	13	50·4	12	24·2	30	8	23
V.		Weymouth(LangtonHerring)	·76	— 2·90	·35	14	8	51·5	12	27·0	30	8	...
,,		Torquay (Cary Green)	·84	...	·62	14	6	54·4	21	31·0	7	1	13
,,		Polapit Tamar [Launceston]..	1·79	— 2·55	·71	14	12	56·0	19	22·0	4	16	21
VI.		Stroud (Upfield)	·94	— 2·39	·48	14	7	48·0	12	25·0	29	13	...
,,		ChurchStretton(Woolstaston)	1·27	— 2·25	·40	7	14	50·5	11	22·0	30	11	...
,,		Tenbury (Orleton)	·97	— 2·17	·34	14	9	51·3	20	18·8	6	12	18
VII.		Leicester (Barkby)	1·13	— 1·16	·54	7	10	51·0	12	17·0	5	22	27
,,		Boston	·83	— 1·37	·40	7	8	50·0	5	26·0	6	12	...
,,		Hesley Hall [Tickhill].....	1·18	— ·84	·60	7	11	51·0	11	20·0	30	8	...
VIII.		Manchester(PlymouthGrove)	1·14	— 1·86	·53	7	10	52·0	12	23·0	5	14	14
IX.		Wetherby (Ribston Hall) ...	1·16	— ·91	·49	8	7	...	...	...	...	...	...
,,		Skipton (Arncliffe)	2·16	— 4·59	·81	14	10	..	...	...	...	...	...
,,		Hull (Pearson Park).	1·41	— ·60	·49	7	11	50·0	1*b*	23·0	30	8	15
X.		Newcastle (Town Moor)	1·68	— ·72	·36	15	15	...	...	...	...	...	...
,,		Borrowdale (Seathwaite).....	4·28	—10·51	1·13	14	11	...	...	...	...	...	...
XI.	WALES.	Cardiff (Ely).....	1·18	— 3·73	·72	14	11	...	...	...	...	...	...
,,		Haverfordwest	1·92	— 3·94	·71	14	14	52·5	18	23·9	5	14	22
,,		Aberystwith (Gogerddan) ...	1·83	— 3·28	·85	7	9	51·0	12	...	...	...	...
,,		Llandudno.....	1·04	— 2·05	·42	7	8	55·5	11	30·4	30	...	...
XII.	SCOTLAND.	Cargen [Dumfries]	1·08	— 3·48	·26	14	8	52·8	12	22·0	30	11	...
,,		Jedburgh (Sunnyside).....	·88	— 1·62	·21	27	10	51·0	12	20·0	30	10	...
XIV.		Colmonell	2·55	...	1·19	14	11	...	...	19·0	30	...	...
XV.		Lochgilphead (Kilmory).....	3·99	— 3·30	·88	14	15	...	...	24·0	3	9	...
,,		Mull (Quinish).....	4·92	— 2·07	·91	14	18	...	...	...	...	...	...
XVI.		Loch Leven Sluices	1·20	— 2·76	·30	14*a*	7	...	...	...	...	...	...
,,		Dundee (Eastern Necropolis)	·75	— 1·95	·20	18	10	55·2	11	26·2	4	6	...
XVII.		Braemar	1·14	— 3·44	·20	6, 13	11	53·0	22	18·0	30	7	18
,,		Aberdeen (Cranford)	1·38	...	·34	14	19	56·0	22	22·0	30	10	..
,,		Cawdor (Budgate)	1·24	— 1·61	·73	6	10	...	...	...	...	...	...
XVIII		Strathconan [Beauly]	1·53	— 5·03	·50	7	6	...	...	...	...	...	...
,,		Glencarron Lodge.....	6·67	...	1·48	9	20	52·0	22	26·6	30	4	...
XIX.		Dunrobin	1·68	— 1·15	·80	6	8	56·5	23	30·0	8, 9	5	...
,,		S. Ronaldsay (Roeberry).....	2·35	— 1·07	·42	9	18	51·0	22	34·0	7	0	...
XX.	IRELAND.	Darrynane Abbey.....	1·94	...	·70	17	15	...	...	...	...	...	...
,,		Waterford (Brook Lodge) ...	1·24	— 2·43	·30	30	10	53·0	12*c*	25·0	10	8	...
,,		O'Briensbridge (Ross)	1·15	...	·44	17	8	...	...	...	...	...	...
XXI.		Carlow (Browne's Hill)	·93	— 2·13	·45	14	8	...	..	...	...	...	...
,,		Dublin (FitzWilliam Square)	·66	— 2·17	·19	14	9	54·0	22	26·2	6	5	14
XXII.		Ballinasloe	1·28	— 2·63	·32	13	13	53·0	22*d*	22·0	6	15	...
,,		Clifden (Kylemore)	3·31	...	·95	17	13	...	...	...	...	.	...
XXIII		Waringstown	1·02	— 2·08	·26	17	11	54·0	12*e*	24·0	8	12	19
,,		Londonderry (Creggan Res.).	1·32	— 3·20	·40	14	12	...	...	...	...	...	...
,,		Omagh (Edenfel)	1·35	— 2·52	·41	14	11	52·0	22	23·0	5	11	14

+Shows that the fall was above the average ; —that it was below it.

a—and 18. *b*—and 11, 22. *c*—and 14. *d*—and 23. *e*—and 21.

METEOROLOGICAL NOTES ON NOVEMBER, 1896.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; T S for Thunderstorm; R for Rain; H for Hail; S for Snow.

ENGLAND.

ADDINGTON.—Only three times during the last 26 years has a smaller rainfall been recorded—viz., in 1871, 1879 and 1889. Foggy only on 7th, 14th and 24th.

BURY ST. EDMUNDS, WESTLEY.—The month was more like March than November, dry easterly winds prevailing. Bar. very high on the 5th, 10th, and from the 21st to the 26th. Favourable for agriculture.

NORWICH, BRUNDALL.—R about half the average. Mean temp. 1°·5 below average. The highest reading of the month is the lowest for many years, and 10° lower than on some days in Nov., 1895. Bar. generally high, and the mean for the month about a quarter of an inch higher than the average. Fog on 14th.

WEYMOUTH, LANGTON HERRING.—A fine, dry, cold month. Mean temp. at 9 a.m. (39°·2) is 5°·2 below the average. For the first time in 25 years the max. temp. in Nov. has been below 52°. The rainfall for the first eleven months of this year—18·66 in.—is the smallest for any corresponding period in 22 years, and only 71 per cent. of the average.

TORQUAY, CARY GREEN.—Rainfall 3·36 in. below the average, the fall for the eleven months, January to November, being 12·11 in. below average. Mean temp. 42°·8, or 4°·5 below average. Duration of sunshine 83 hours 20 minutes, being 21 hours 40 minutes above the average; six sunless days.

POLAPIT TAMAR [LAUNCESTON].—Exceptionally dry and cold, easterly winds prevailing, with the least rainfall for November during 16 years. The total rainfall for the 11 months of the year is 6·86 in. below the average. H on 14th and 15th. Fog on 18th and 22nd. S on 28th.

WOOLSTASTON.—A cold, but seasonable month, sharp frosts on the grass most nights. S fell on 7th. Mean temp. 38°·5.

TENBURY, ORLETON.—A very dry, cold month, the driest November since 1871, and the coldest since 1861, the mean temp. being nearly 5°·5 below the average of 35 years. Severe frost from the 4th to the 7th, and again at the end of the month, and frequently between. Fog on six days. During the past eleven months less than 19 inches of R has fallen, while the average of 65 years is more than 27 inches.

LEICESTER, BARKBY.—A variable month, with deficient rainfall. High winds and bitterly cold weather during the last week. Mean temp. 37°·6.

MANCHESTER, PLYMOUTH GROVE.—The coldest November since observations commenced in 1868, with two exceptions, namely, November, 1871 and 1878. Thick fog on 9th. Dense fog on 4th, 5th, 6th and 17th. Fine autumn weather on the 2nd and 3rd, and the last four days. Mean temp. 38°·5.

ARNCLIFFE.—A very dry month. Rainfall far below the average.

WALES.

HAVERFORDWEST.—A remarkably fine month, with an unusual amount of bright sunshine and many cloudless days. The rainfall was small, occurring principally at night. One of the most frosty Novembers recorded here, most

of the grass readings being very low. Remarkably high readings of the bar. from 19th to 25th, the mercury standing at 9 p.m. on the 24th at 30·589 in. (corrected). Prevailing winds N.E. and E. The severe frost of the last three days has been equalled only in November, 1890; from 28th to 30th the ice was thick enough to bear on shallow ponds.

ABERYSTWITH, GOGERDDAN.—Very dull and damp throughout the month very little sunshine.

SCOTLAND.

CARGEN [DUMFRIES].—The bar. pressure for the month is 1·365 in. above the average for 37 years, and a higher figure has only thrice been registered at this station—in 1867, 1879 and 1889. The rainfall of the month is one of the lowest on record, having been smaller only in 1867 and 1879. The fall for the eleven months of the year is 5·74 in. below the average. The sky was unusually overcast, the hours of sunshine being only 57, while the average is 88. Easterly winds prevailed on 15 days, a somewhat unusual experience at this season. Farm work progressed rapidly. Snow drops commenced to show their points during the last week.

JEDBURGH.—The month was marked by atmospheric quietness; total rainfall is much below the average, and a good deal of frost prevailed, but it did not last long, and country work was not suspended.

COLMONELL.—Rainfall 2·84 in. less than the average for 20 years. Mean temp. 0°·4 below the average.

S. RONALDSAY, ROEBERRY.—A very good month. Mean temp. 43°·6, or 0°·7 above the average of 6 years.

IRELAND.

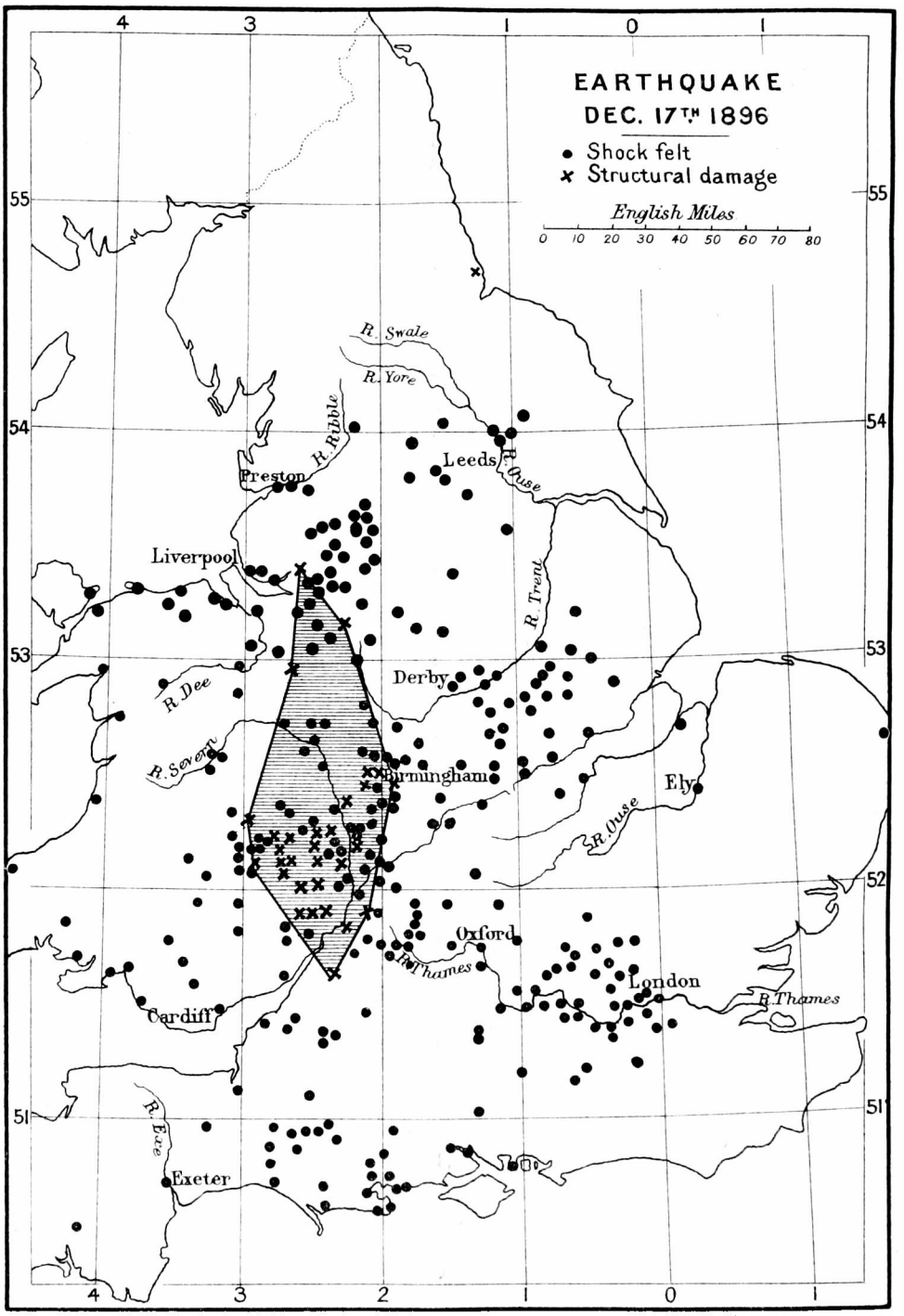
DARRYNANE ABBEY.—A dry month. The first part very fine, but cold, with frost on 4th, 5th and 6th; then mild and showery to the 25th, and cold thence to the end. Narcissus above ground, and some few plants of it in flower early in the month.

WATERFORD, BROOK LODGE.—The driest November since 1879.

O'BRIENSBRIDGE, ROSS.—The finest month of November since 1879, when the rainfall was ·99 in. falling on 10 days.

DUBLIN.—A fine, quiet, rather cold month, and the scanty rainfall established a record for November. The bar. ruled high. Mean temp. 43°·2, or 1°·5 below the average. High winds were noted on seven days, and attained the force of a gale on the 5th and 28th. Foggy on 4th, 5th, 6th, 9th, 16th, 17th, 22nd and 24th. Lunar halos were seen on the 13th and 19th; solar halos on the 4th and 9th.

OMAGH, EDENFEL.—The driest November, or rather that with the least rainfall, since records commenced here in 1864, but the saturation of the atmosphere was frequently so great as to produce a measurable quantity of water in the gauge. It was, however, a seasonable month, with no frost sufficient to interrupt its suitability for farm labour.



STANFORD'S GEOG^L ESTAB^T LONDON.